

2.2 ADDITIONAL MHC TECHNOLOGIES

The MHC technologies described in Section 2.1 represent the technologies that were evaluated in this CTSA. However, additional MHC technologies exist which were not evaluated in the CTSA for one or more of the following reasons:

- A product line was not submitted for the technology by any chemical supplier.
- The technology was not available to be tested in the Performance Demonstration.
- The technology has only recently been commercialized since the evaluation began or was submitted too late to be included in the evaluation.

Despite not being evaluated, these technologies are important because they are alternative methods for MHC that accomplish the removal of formaldehyde from PWB manufacturing, which is a goal of members of the PWB industry. A brief description of two MHC technologies not evaluated in this CTSA is presented below. Other technologies may exist, but they have not been identified by the project.

2.2.1 Lomerson Process

The lomerson process utilizes the drilling operation itself as the mechanism to apply a conductive layer of material to the substrate surface of drilled through-holes. The panels can then be cleaned and etched as with other MHC processes before undergoing subsequent manufacturing processes. Completed panels can be assembled and soldered using typical PWB manufacturing methods.

In this process a drill bit is forced through the substrate and into a block of soft conductor material, usually indium or an indium-alloy. While the bit is turning, conductive cuttings from the block are carried up through the hole and smeared throughout the barrel of the drilled hole by the turning drill bit. The smeared material forms the conductive coating required to connect the different layers of the PWB. The lomerson process was described several years ago, but is still in development. However, the process continues to generate interest due to its obvious efficiencies (EPA, 1995).

2.2.2 Non-Formaldehyde Electroless Nickel

The electroless nickel process uses a non-formaldehyde reducing agent to deposit a conductive coating of nickel into the barrels of drilled through-holes. The process is similar to the other wet processes presented earlier in this chapter. It consists of a sequence of chemical baths separated by water rinse steps through which previously drilled and desmeared PWB panels are processed. The supplier recommended sequence of process steps are as follows:

- Conditioner.
- Microetch.
- Sensitizer.
- Activator.
- Dry.

- Cleaner.
- Electroless nickel.

The non-formaldehyde electroless nickel process may be operated in either conveyORIZED or non-conveyORIZED modes and is compatible with most types of substrates. While the electroless nickel process is a mature technology (EPA, 1995) very few PWB facilities currently use this technology. No suppliers submitted this technology at the beginning of the CTSA, although one supplier came forward after the Performance Demonstration.